

CLAIMS

WHAT IS CLAIMED IS:

- 1 1. A method for preventing hijacking of an aircraft, comprising operations of:
2 providing a hijacking intervention module aboard an aircraft having an autopilot system;
3 the module sensing a predetermined override input;
4 responsive to the sensing of the predetermined override input, the module performing operations
5 comprising:
6 deactivating on-board control of predetermined aircraft flight systems;
7 deactivating on-board control of the autopilot system;
8 directing the autopilot system to fly the aircraft to a landing.

- 1 2. The method of claim 1, the operations responsive to the sensing of the predetermined override
2 input further comprising:
3 receiving manual commands from at least one remote guidance facility, the manual commands
4 comprising instructions to manually manipulate specified aircraft flight systems.

- 1 3. The method of claim 2, the specified aircraft flight systems comprising one or more of the
2 following: rudder, elevator, engine power, flaps, landing gear, brakes, reverse thrust, spoilers, dive
3 brakes, nosewheel steering.

- 1 4. The method of claim 1, the operation of directing the autopilot system comprising:

2 the module receiving flight routing and landing instructions from at least one remote guidance
3 facility;
4 directing the autopilot system to fly the aircraft according to the flight routing and to land
5 according to the landing instructions.

1 5. The method of claim 4, the operation of receiving flight routing and landing instructions
2 comprising:
3 receiving the flight routing and landing instructions via satellite relay.

1 6. The method of claim 4, the operation of receiving flight routing and landing instructions
2 comprises receiving encrypted flight routing and landing instructions.

1 7. The method of claim 1, the operation of directing the autopilot system comprising:
2 the module self-identifying flight routing and landing instructions meeting predetermined
3 qualifications;
4 directing the autopilot system to fly the aircraft according to the self-identified flight routing and
5 landing instructions.

1 8. The method of claim 7, the operation of the module self-identifying flight routing and landing
2 instructions meeting predetermined qualifications including executing a pre-programmed automated
3 routine to select a landing site meeting preset criteria.

1 9. The method of claim 1, the operation of directing the autopilot system comprising:

2 determining whether flight routing and landing instructions have been received from at least one
3 remote guidance facility;
4 responsive to absence of flight routing and landing instructions from the remote guidance
5 facility, the module self-identifying a flight routing and landing instructions meeting
6 predetermined qualifications and then directing the autopilot system to fly the aircraft
7 according to the flight routing and landing instructions.

1 10. The method of claim 9, the operations responsive to the sensing of the predetermined override
2 input further comprising:

3 attempting to obtain flight routing and landing instructions from the remote guidance facility.

1 11. The method of claim 1, the operation of directing the autopilot system comprising:
2 the module attempting to self-identify flight routing and landing instructions meeting
3 predetermined qualifications;
4 responsive to absence of successful completion of the self-identifying of flight routing and
5 landing instructions, the module obtaining flight routing and landing instructions from
6 at least one remote guidance facility and directing the autopilot system to fly the aircraft
7 according to the flight routing and to land according to the landing instructions.

1 12. The method of claim 1, the operation of sensing the predetermined override input comprising:
2 the module receiving a predetermined override signal transmitted by a remote guidance facility.

1 13. The method of claim 1, the operation of sensing the predetermined override input comprising:
2 the module detecting activation of a panic button aboard the aircraft.

1 14. The method of claim 1, the operations responsive to the sensing of the predetermined override
2 input further comprising:
3 deactivating aircraft communications equipment.

1 15. The method of claim 1, the operations further comprising assembling and transmitting accident
2 reconstruction information to a remote station, said information including one or more of the following:
3 data stored by an on-board flight data recorder;
4 data stored by an on-board cockpit voice recorder.

1 16. The method of claim 1, the operations further comprising assembling and transmitting aircraft
2 condition information to the remote guidance facility, said information comprising one or more of the
3 following: airspeed, fuel remaining, altitude, position, attitude, heading, engine condition.

1 17. The method of claim 1,
2 the operations further comprising providing a relay interposed between pilot controls and the
3 predetermined aircraft flight control systems;
4 where the operation of deactivating on-board control of the predetermined aircraft flight systems
5 is performed by operating the relay to electrically disconnect the pilot controls from the
6 predetermined aircraft flight systems.

1 18. A signal-bearing medium tangibly embodying a program of machine-readable instructions
2 executable by a hijacking intervention module aboard an aircraft having an autopilot system to perform
3 a method for preventing hijacking of the aircraft, the operations comprising:

4 sensing a predetermined override input;

5 responsive to the sensing of the predetermined override input, performing operations
6 comprising:

7 deactivating on-board control of predetermined aircraft flight systems;

8 deactivating on-board control of the autopilot system;

9 directing the autopilot system to fly the aircraft to a landing at a landing site.

1 19. The medium of claim 18, the operations responsive to the sensing of the predetermined override
2 input further comprising:

3 receiving manual commands from at least one remote guidance facility, the manual commands
4 comprising instructions to manually manipulate specified aircraft flight systems.

1 20. The medium of claim 19, the specified aircraft flight systems comprising one or more of the
2 following: rudder, elevator, engine power, flaps, landing gear, brakes, reverse thrust, spoilers, dive
3 brakes, nosewheel steering.

1 21. The medium of claim 18, the operation of directing the autopilot system comprising:
2 the module receiving flight routing and landing instructions from at least one remote guidance
3 facility;

directing the autopilot system to fly the aircraft according to the flight routing and to land according to the landing instructions.

22. The medium of claim 18, the operation of directing the autopilot system comprising:
the module self-identifying flight routing and landing instructions meeting predetermined qualifications;
directing the autopilot system to fly the aircraft according to the self-identified flight routing and landing instructions.

23. The medium of claim 22, the operation of the module self-identifying flight routing and landing instructions meeting predetermined qualifications including executing a pre-programmed automated routine to select a landing site meeting preset criteria.

24. The medium of claim 18, the operation of directing the autopilot system comprising:
determining whether flight routing and landing instructions have been received from at least one remote guidance facility;
responsive to absence of flight routing and landing instructions from the remote guidance facility, the module self-identifying a flight routing and landing instructions meeting predetermined qualifications and then directing the autopilot system to fly the aircraft according to the flight routing and landing instructions.

25. The medium of claim 24, the operations responsive to the sensing of the predetermined override input further comprising:

3 attempting to obtain flight routing and landing instructions from the remote guidance facility.

1 26. The medium of claim 18, the operation of directing the autopilot system comprising:
2 the module attempting to self-identify flight routing and landing instructions meeting
3 predetermined qualifications;
4 responsive to absence of successful completion of the self-identifying of flight routing and
5 landing instructions, the module obtaining flight routing and landing instructions from
6 at least one remote guidance facility and directing the autopilot system to fly the aircraft
7 according to the flight routing and to land according to the landing instructions.
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1 27. The medium of claim 18, the operation of sensing the predetermined override input comprising:
2 the module receiving a predetermined override signal transmitted by a remote guidance facility.

1 28. The medium of claim 18, the operation of sensing the predetermined override input comprising:
2 the module detecting activation of a panic button aboard the aircraft.

1 29. The medium of claim 18, the operations responsive to the sensing of the predetermined input
2 signal further comprising:
3 deactivating aircraft communications equipment.

1 30. The medium of claim 18, the operations further comprising assembling and transmitting accident
2 reconstruction information to a remote station, said information including one or more of the following:

3 data stored by an on-board flight data recorder;
4 data stored by an on-board cockpit voice recorder.

1 31. The medium of claim 18, the operations further comprising assembling and transmitting aircraft
2 condition information to the remote guidance facility, said information comprising one or more of the
3 following: airspeed, fuel remaining, altitude, position, attitude, heading, engine condition.

1 32. The medium of claim 18, a relay being interposed between pilot controls and the predetermined
2 aircraft flight control systems, the operation of deactivating on-board control of the predetermined
3 aircraft flight systems comprising is performed by operating the relay to electrically disconnect the pilot
4 controls from the predetermined aircraft flight systems.

1 33. A logic circuit of multiple interconnected electrically conductive elements configured to perform
2 operations to prevent hijacking of an aircraft by operating a hijacking intervention module aboard the
3 aircraft, the operations comprising:

4 sensing a predetermined override input;

5 responsive to the sensing of the predetermined override input, performing operations
6 comprising:

7 deactivating on-board control of predetermined aircraft flight systems;

8 deactivating on-board control of the autopilot system;

9 directing the autopilot system to fly the aircraft to a landing.

1 34. An anti-hijacking system for use in an aircraft having an autopilot system, comprising:

2 a transceiver to communicate with remote stations;
3 a manual panic input;
4 a manager, coupled to the transceiver and the manual panic input, programmed to perform
5 operations comprising:
6 sensing a predetermined override input comprising one or more of the following:
7 activation of the manual panic input, receipt of a predetermined override signal
8 from a remote guidance facility via the transceiver;
9 responsive to the sensing of the predetermined override input, the manager performing
10 operations comprising:
11 deactivating on-board control of predetermined aircraft flight systems;
12 deactivating on-board control of the autopilot system;
13 directing the autopilot system to fly the aircraft to a landing.

1 35. The apparatus of claim 34, the manager being further programmed such that the operations
2 responsive to the sensing of the predetermined override input further comprise:
3 receiving manual commands from at least one remote guidance facility, the manual commands
4 comprising instructions to manually manipulate specified aircraft flight systems.

1 36. The apparatus of claim 35, the manager being programmed such that the specified aircraft flight
2 systems comprise one or more of the following: rudder, elevator, engine power, flaps, landing gear,
3 brakes, reverse thrust, spoilers, dive brakes, nosewheel steering.

1 37. The apparatus of claim 34, the manual panic input comprising a portable remote control switch.

1 38. The apparatus of claim 34, the manager including an input coupled to an on-board aircraft master
2 computer, the manager being further programmed to collect aircraft condition information from the
3 master computer and operate the transceiver to transmit the collected information to a remote station,
4 the aircraft condition information comprising one or more of the following: airspeed, fuel remaining,
5 altitude, position, attitude, heading, engine condition.

1 39. The apparatus of claim 34,
2 further comprising a relay coupled between pilot controls and the predetermined aircraft flight
3 control systems;
4 the manager being programmed such that the operation of deactivating on-board control of the
5 predetermined aircraft flight systems comprises activating the relay to electrically
6 disconnect the pilot controls from the predetermined aircraft flight systems.

1 40. The apparatus of claim 34, further comprising:
2 a source of position information comprising at least one of the following: a position locating
3 device, an interface to a position locating device;
4 the manager being further programmed to collect position information from the source and
5 operate the transceiver to transmit the collected position information to a remote station.

1 41. The apparatus of claim 34, the manager programmed such that the operation of directing the
2 autopilot system comprises:
3 receiving flight routing and landing instructions from a remote guidance facility;

4 directing the autopilot system to fly the aircraft according to the flight routing and to land
5 according to the landing instructions.

1 42. The apparatus of claim 41, the manager programmed such that the operation of receiving flight
2 routing and landing instructions comprises:
3 receiving the flight routing and landing instructions via satellite relay.

1 43. The apparatus of claim 34, the manager programmed such that the operation of receiving flight
2 routing and landing instructions comprises receiving encrypted flight routing and landing instructions.

1 44. The apparatus of claim 34, the manager programmed such that the operation of directing the
2 autopilot system comprises:
3 the module self-identifying flight routing and landing instructions meeting predetermined
4 qualifications;
5 directing the autopilot system to fly the aircraft according to the self-identified flight routing and
6 landing instructions.

1 45. The apparatus of claim 44, the operation of the module self-identifying flight routing and landing
2 instructions meeting predetermined qualifications including executing a pre-programmed automated
3 routine to select a landing site meeting preset criteria.

1 46. The apparatus of claim 34, the manager programmed such that the operation of directing the
2 autopilot system comprises:

3 determining whether flight routing and landing instructions have been received from at least one
4 remote guidance facility;
5 responsive to absence of flight routing and landing instructions from the remote guidance
6 facility, the module self-identifying a flight routing and landing instructions meeting
7 predetermined qualifications and then directing the autopilot system to fly the aircraft
8 according to the flight routing and landing instructions.

1 47. The apparatus of claim 46, the manager programmed such that the operations responsive to the
2 sensing of the predetermined override input further comprises:
3 attempting to obtain flight routing and landing instructions from the remote guidance facility.

1 48. The apparatus of claim 34, the manager programmed such that the operation of directing the
2 autopilot system comprises:
3 attempting to self-identify flight routing and landing instructions meeting predetermined
4 qualifications;
5 responsive to absence of successful completion of the self-identifying of flight routing and
6 landing instructions, obtaining flight routing and landing instructions from at least one
7 remote guidance facility and directing the autopilot system to fly the aircraft according
8 to the flight routing and to land according to the landing instructions.

1 49. The apparatus of claim 34, the manager programmed such that the operation of sensing the
2 predetermined override input comprises:
3 the module receiving a predetermined override signal transmitted by a remote guidance facility.

1 50. The apparatus of claim 34, the manager programmed such that the operation of sensing the
2 predetermined override input comprises:

3 the module detecting activation of a panic button aboard the aircraft.

1 51. The apparatus of claim 34, the manager programmed such that the operations responsive to the
2 sensing of the predetermined override input further comprise:

3 deactivating aircraft communications equipment.

1 52. The apparatus of claim 34, the manager programmed such that the operations further comprise
2 assembling and transmitting accident reconstruction information to a remote station, said information
3 including one or more of the following:

4 data stored by an on-board flight data recorder;

5 data stored by an on-board cockpit voice recorder.

1 53. The apparatus of claim 34, the manager programmed such that the operations further comprise
2 assembling and transmitting aircraft condition information to the remote guidance facility, said
3 information comprising one or more of the following: airspeed, fuel remaining, altitude, position,
4 attitude, heading, engine condition.

1 54. The apparatus of claim 34, the transceiver including a transmitter and receiver configured to
2 exchange data via satellite.

1 55. An anti-hijacking system for use in an aircraft having an autopilot system, comprising:
2 first means for communicating with remote stations;
3 second means for receiving manual panic input;
4 processing means, coupled to the first and second means, for operations comprising:
5 recognizing occurrence of one or more predetermined override signals arising from one
6 or more of the following: activation of the second means, receipt of
7 predetermined override signals from one or more remote stations via the first
8 means;
9 responsive to the receiving of one or more predetermined override signals, the processor
10 performing operations comprising:
11 deactivating on-board control of aircraft flight systems;
12 deactivating on-board control of the autopilot system;
13 directing the autopilot system to fly the aircraft to a landing at a landing site.